

**SIGNPOSTS of PLANETS**  
**NASA Goddard Space Flight Center**  
**October 18,19,20**  
**2011**

**Meeting Schedule**  
**DRAFT: October 4, 6:00 pm**

**When you see a disk, what can it tell you about the  
underlying planetary system?**

**Tuesday, October 18**

Buses:

8:30 AM – First bus leaves Holiday Inn for Goddard's Main Gate

8:00 AM – First bus leaves the Courtyard Marriott for Goddard's Main Gate

8:00 am -10:00 badging at the main gate

9:45 am - 10:15 am Coffee!

10:15 am-10:25 am

*Welcome*

**Marc Kuchner** (Goddard Space Flight Center)

**Session I: Theoretical Overview of Planet Signposts**

**Chair: Christopher Stark** (Carnegie, DTM)

10:25 am-11:00 am (review)

*Theory of Disk-Planet Interactions, An Overview*

**Alice Quillen** (University of Rochester)

11:00 am-11:35 (review)

*Hydro Simulations of Planet Signposts*

**Sijme-Jan Paardekooper**

11:35 am-12:10pm (review)

*Planet Signposts and Planetary Ring Physics*

**Aurelien Crida** (Observatoire de la Côte d'Azur)

12:10pm-2:25 pm

Lunch and Posters

## **Session II: Gas Disks, Transitional Disks**

**Chair: TBD**

2:25-2:45

*Disk Evolution: an Overview*

**James Muzerolle** (STSCI)

2:45-3:05

*Infrared Variability of Transition Disks: Influence of a Planet?*

**Kevin Flaherty** (University of Arizona)

3:05-3:40 (review)

*Non-planet Mechanisms for Sculpting and Clearing Gas Disks*

**Cathie Clarke** (University of Cambridge)

3:40-4:00 Coffee!

4:00-4:35 (review)

*Modeling Disks with Inner Holes and Gaps: Evidence for Newly-Formed Planets*

**Catherine Espaillat** (CfA)

4:35-5:10 (review)

*Signs of Planets in Young Disks*

**Hannah Jang-Condell** (University of Wyoming)

5:10-5:30

*Observable structures in illuminated, optically thick gas and dust disks*

**Pawel Artymowicz** (University of Toronto) and Jeffrey Fung (University of Toronto)

Buses:

6:00 PM - Leaves Goddard Visitors Center for the Holiday Inn

6:00 PM - Leaves Goddard Visitors Center for the Courtyard Marriott

**Wednesday, October 19**

Buses:

8:30 AM – First bus leaves Holiday Inn for Goddard's Visitors Center

8:00 AM – First bus leaves the Courtyard Marriott for Goddard's Visitors Center

## **Session III: Signposts and Planet Formation**

**Chair: Thayne Currie** (NASA Goddard)

9:00-9:20

*Implications of Giant Planet Formation in the Protoplanetary Disk around AB Aurigae*

**Jun Hashimoto** (National Astronomical Observatory of Japan) and Takayuki Muto (Tokyo Institute of Technology)

9:20-9:40

*The SEEDS of Planet Formation: Observations of Transitional Disks*

**Carol Grady** (GSFC)

9:40-10:00

*Spitzer Evidence for an LHB-Like Delivery of Organics & Water at 1.4 Gyr to the THZ of Eta Corvi*

**Carey M. Lisse** (Johns Hopkins University Applied Physics Lab), C.H. Chen (STScI), M.C. Wyatt (University of Cambridge), A. Morlok, D.M. Watson, P. Manoj, and T. Currie

10:00-10:20

*A Young Exoplanet Caught at Formation*

**Adam Kraus** (University of Hawaii Institute for Astronomy)

10:20-10:40 coffee

10:40-11:30 (double review)

*HST Imaging of Disks*

**Glenn Schneider** (University of Arizona) and **Karl Stapelfeldt** (NASA Goddard Space Flight Center)

#### **Session IV: Future Missions**

**Chair: Mario Perez** (NASA HQ)

11:30-11:50

*Future Missions to Study Signposts of Planets*

**Wesley Traub** (JPL)

11:50-2:20 Lunch, JWST Highbay Tour, and Posters

2:20-2:50

*Signposts of Planets JWST Will Observe*

**Mark Clampin** (NASA Goddard Space Flight Center)

#### **Session V: More Resolved Disk Images**

**Chair: David Leisawitz**

2:50-3:25 (review)  
*Sub-mm Imaging of Disks*  
**David Wilner** (CfA)

3:25-3:45  
*Spatially Resolving Debris Disks at Millimeter Wavelengths*  
**A. Meredith Hughes** (UC Berkeley)

3:45-4:00 Coffee!

4:00-4:35 (review)  
*Non-Planet Debris Disk Structures*  
**Kate Su** (University of Arizona)

4:35-5:10 **“Where are the planets?” Brainstorming session! Send your favorite disk images to Erika Nesvold ([erika.r.nesvold@nasa.gov](mailto:erika.r.nesvold@nasa.gov)) by October 14. We’ll discuss them as a group and try to decide what planets are in them.**

5:30 Walk to the visitor’s center, and move cars to the visitor’s center parking lot.

6:00 Bus leaves from the Visitor’s Center to the banquet.

7:00 – 9:00 PM - BANQUET  
Mike’s Restaurant/Crab House, 3030 Riva Road, Riva, MD 21140

9:00 Buses leave the banquet. One bus goes to the hotels; one goes to the Visitor’s Center.

### **Thursday, October 20**

Buses:

8:30 AM – First bus leaves Holiday Inn for Goddard’s Visitors Center

8:00 AM – First bus leaves the Courtyard Marriott for Goddard’s Visitors Center

**Session VI: Herschel and Kepler**  
**Chair: Hannah Jang-Condell** (University of Wyoming)

9:00-9:35 (review)  
*Signposts of Planets Observed by Herschel*  
**Brenda Matthews** (Herzberg Institute of Astrophysics)

9:35-9:55

"DUNES": A Herschel search for cold, faint discs around nearby stars  
**Jonathan Marshall** (Universidad Autonoma de Madrid) and the DUNES team.

9:55-10:15

*HD 100546: a disk, a gap, and a planet?*

**Francois Menard** (IPAG, Observatoire de Grenoble), Wing-Fai Thi (IPAG, Observatoire de Grenoble), Myriam Benisty (MPIA, Heidelberg), C. Pinte, P. Varniere, and the GASPS Consortium

10:15-10:35 Finally, some coffee!

10:35-10:55

*Searching for Exozodiacal Clouds with Kepler*

**Christopher Stark** (Carnegie Institute of Washington DTM)

## **Session VII: Disks and Direct Imaging of Exoplanets**

**Chair: Justin Crepp**

10:55-11:30 (review)

*Planets Found by Direct Imaging*

**Christian Marois** (Herzberg Institute of Astrophysics)

11:30-11:50

*Beta Pictoris b and its relation to the debris disk*

**Anne-Marie Lagrange** (IPAG/CNRS), Anthony Boccaletti, (LESIA/CNRS), Julien Milli (IPAG) and Gael Chauvin (IPAG/CNRS)

11:50-12:10

*Using Debris Disks to Constrain the Architecture and Formation of Directly Imaged Planetary Systems*

**Thayne Currie** (NASA Goddard Space Flight Center)

12:15-2:30

Lunch and Posters

2:30-2:50

*Signposts of Planets Observed By SEEDS*

**Mike McElwain** (NASA Goddard Space Flight Center)

2:50-3:10

*Fomalhaut's debris disk as seen by Herschel*

**Michiel Min** (Sterrenkundig Instituut, Utrecht University), Bram Acke (Instituut voor Sterrenkunde, University of Leuven), Carsten Dominik (Sterrenkundig Instituut, University of Amsterdam), Bart Vandenbussche, Christoffel Waelkens (Instituut voor Sterrenkunde, University of Leuven) and the Herschel GT debris disc team

## **Session VIII: Evolution of Planetary Systems**

**Chair: TBD**

3:10-3:30

*A Signpost of Disks in the Distribution of Planets*

**Ruth Murray-Clay** (Harvard-Smithsonian CfA)

3:30-3:50

*Collisional Cascades as Signposts of Planets*

**Margaret Pan** (U.C. Berkeley)

3:50-4:10 Another well-deserved hit of sweet, sweet coffee

4:10-4:45 (review)

*Born Again Disks as Signposts of Planets*

**John Debes** (Space Telescope Science Institute)

4:45-5:05

*The Coldest Imaged Companion*

**Kevin Luhman** (Penn State)

5:05-5:15 **wrap up**

**Karl Stapelfeldt** (Goddard)

Buses:

6:00 PM - Leaves Goddard Visitors Center for the Holiday Inn

6:00 PM - Leaves Goddard Visitors Center for the Courtyard Marriott

Review talks: 30 minutes + 5 minutes for questions

Contributed talks: 15 minutes + 5 minutes for questions

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## **POSTERS**

### **Younger Disks**

*Evolving Disks in the Cep OB3b Young Cluster*

**Thomas S. Allen** (University of Toledo), S. T. Megeath (University of Toledo), Judy Pipher (University of Rochester), Robert Gutermuth (Smith College) and Scott Wolk (CfA)

*Protoplanetary disk at the astronomical unit scale: the PIONIER/VLTI view*

**Jean-Philippe Berger** (European Southern Observatory), JB. Lebouquin, B. Lazareff, F. Menard (IPAG, Grenoble), M. Benisty, J. Olofsson (MPIA, Heidelberg) and

The PIONIER collaboration

*Characterizing the large hole in the disk around Oph IRS 48 in dust and gas*

**Joanna Brown** (Harvard-Smithsonian Center for Astrophysics), Gregory Herczeg (Max-Planck-Institut fuer extraterrestrische Physik), David Wilner, (Harvard-Smithsonian Center for Astrophysics), Ewine van Dishoeck (Leiden Observatory), Sean Andrews, (CfA), and Klaus Pontoppidan (STScI)

*Exploring the Inner Regions of Cleared Circumstellar Disks: New Results from Keck*

**Sasha Hinkley** and John M. Carpenter (Caltech), Adam Kraus (IfA Hawaii) and Michael J. Ireland (University of Sydney)

*Another evidence for the inner hole in the disk around the Herbig Ae star HD169142*

**Mitsuhiko Honda** (Kanagawa University)

*Signposts of Planet Formation in the Disk of GM Aur*

**Jeremy Hornbeck** (University of Louisville), Carol Grady (GSFC and Eureka Scientific) Gerard Williger (University of Louisville and U. de Nice, France), A. Brown (U. Colorado) M. Perrin (STScI), J. Wisniewski (U. Washington) et al.

*Circumstellar Gas and Dust in a Slowly Accreting T Tauri Star*

**Laura Ingleby** and Nuria Calvet (University of Michigan) Gregory Herczeg MPE, Edwin Bergin (University of Michigan) and the DAO Collaboration

*Radio and Infrared Studies of Nearby, Irradiated, Gaseous Protoplanetary Disks*

**Joel Kastner** (Rochester Institute of Technology) G. Germano Sacco (Rochester Institute of Technology)

*Transitional disks in the youngest nearby star-forming regions: their trends and insights of planet formation*

**Kyoung Hee Kim**, Dan Watson and Manoj Puravankara (University of Rochester) L. Arnold, B. Forrest (U of Rochester), J. Najita (NOAO), and N. Calvet (U of Michigan)

*A Search for Substellar Companions of T Tauri Stars*

**C.M. Johns-Krull**, N. Mahmud, P. Hartigan (Rice University), C. Crockett, L. Prato (Lowell Observatory), D. Jaffe (UT Austin) and C. Beichman (NExScI)

*Reading the Signs: The Case for Spatial and Spectral Far-infrared Interferometry*

**David Leisawitz** (NASA GSFC) and the SPIRIT Mission Concept Study Team

*Protoplanetary Herbig Ae/Be discs as seen with Herschel*

**Gwendolyn Meeus** (UAM, Madrid, Spain) and the GASPS team

*Polarimetric Imaging of the Circumstellar Environments of Young Stars*

**Michiel Min**, Sandra Jeffers Christoph Keller, Michiel Rodenhuis, and Hector Canovas (Sterrenkundig Instituut, Utrecht University)

*Structure and variability of the planet-forming regions in the disc around HD100546*

**Olja Panic** (European Southern Observatory) Gijs Mulders (University of Amsterdam) Thorsten Ratzka (University Observatory Munich), Roy Van Boekel (MPIA), Carsten Dominik (University of Amsterdam) and Michiel Min (Utrecht Observatory)

*The dust and gas disk around the young M5 star IRAS 04158+2805*

**Christophe Pinte** and Francois Menard (IPAG Grenoble), Gaspard Duchene (Berkeley) and the GASPS team

*Silica in Protoplanetary Disks as a Signpost of Planet Formation*

**Benjamin Sargent** (Space Telescope Science Institute), William Forrest and Asish Basu (University of Rochester)

*WISE Detection of Primordial/Debris Disks in the epsilon Cham Association*

**Michal Simon** (Stony Brook University) Ana-Marie Constantin (Intern'l Computer High School, Bucharest) and Michele Silverstein (Cornell University)

*Powering the Line Emission from Planet-Forming Disk Atmospheres*

**Neal Turner** (JPL/Caltech) and Shigenobu Hirose (JAMSTEC)

*Transitional disks: Gap opening by planets?*

**Zhaohuan Zhu** (Princeton University), Richard P. Nelson (Queen Mary, University of London), Lee Hartmann (University of Michigan), Catherine Espaillat (Center for Astrophysics)

## **Older Disks**

*Constraining Debris Disc Radii with Resolved Images from the DEBRIS Survey*

**Mark Booth** (University of Victoria) and the DEBRIS Team

*Coronagraphic Angular Differential Imaging of HD 32297: Analysis of the disk morphology*

**Anthony Boccaletti** (LESIA, Paris Observatory), Anne-Marie Lagrange (IPAG) Pierre Baudoz (LESIA, Paris Observatory), D. Mawet (ESO), J.-C. Augereau, D. Mouillet, and J. Lebreton (IPAG)

*SKARPS: the Search for Kuiper belts Around Radial-velocity Planet Stars*

**Geoffrey Bryden** (JPL), Jonathan Marshall (UNAM), Karl Stapelfeldt (NASA Goddard Space Flight Center), Kate Su (Univ. of Arizona) and Mark Wyatt (Cambridge)

*Resolving binary systems and a debris disk around A-stars*

**Joanna Bulger** and J. Patience (University of Exeter)

*Keck Adaptive Optics Imaging of the HD 32297 Debris Disk*



**Tom Esposito** and Michael P. Fitzgerald (UCLA), Paul Kalas (UC Berkeley), James R. Graham (UC Berkeley, U. Toronto)

*Constraining Small Body Disruption Parameters-- Towards Reducing Confusion in Exoplanet Searches*

**Ashley J. Espy** and Josh Colwell (University of Central Florida, Dept. of Physics), Stanley Dermott (University of Florida, Dept. of Astronomy), Thomas J. J. Kehoe (Florida Space Institute/ UCF Physics)

*MMT AO Imaging of Water Ice in Circumstellar Disks and Future Prospects at Magellan*  
**Katherine Follette** and Laird Close (University of Arizona)

*Modal Analysis on the Disk Instability Induced by Radiation Pressure*

**Jeffrey Fung** and Pawel Artymowicz (University of Toronto)

*Sources of the zodiacal dust cloud*

**Sergei I. Ipatov** (Catholic Univ of America, Space Research Institute)

*The 99 Herculis circumbinary debris disk*

**Grant Kennedy** and Mark Wyatt (Institute of Astronomy ,Cambridge, UK), Bruce Sibthorpe (UKATC, Edinburgh, UK)

*A new offset debris ring around a nearby star observed with the HST/STIS coronagraph*

**John Krist** (JPL) Karl Stapelfeldt (GSFC & JPL), Geoffrey Bryden (JPL) Peter Plavchan (NExSci)

*A detailed study of two debris disks seen by Herschel*

**Jérémy Lebreton**, J.-C. Augereau, W.-F. Thi (IPAG, Grenoble), A. Roberge, J. Donaldson (NASA Goddard Space Flight Center)

*A resolved debris disk around the planet-hosting, low-mass, and old star GJ581*

**Jean-Francois Lestrade** (Observatoire de Paris)

*Stripping a debris disk by close stellar encounters in an open cluster*

**Jean-Francois Lestrade**, A. Lassus, N. Phou, and E. Morey (Observatoire de Paris)

*Angular Differential Imaging of circumstellar disks*

**Julien Milli**, Anne-Marie Lagrange, and David Mouillet (IPAG, Grenoble, France)

*Common Warm Dust Temperatures around Main Sequence Stars*

**Farisa Morales** (JPL), George Rieke (UofA), Michael Werner (JPL), Karl Stapelfeldt (NASA Goddard Space Flight Center), Geoffrey Bryden (JPL), Kate Su (UofA)

*Crystalline forsterite as a signpost of planet formation in the disk of HD100546*

**Gijs Mulders** (University of Amsterdam), Rens Waters (Netherlands Institute for Space Research, Utrecht), Carsten Dominik (University of Amsterdam) and the DIGIT team

*A Collisional Algorithm for Modeling Circumstellar Debris Disks*

**Erika Nesvold** (University of Maryland, Baltimore County) and Marc Kuchner (NASA Goddard Space Flight Center)

*Warm Debris Disk Candidates from WISE*

**Deborah Padgett** and Karl Stapelfeldt (GSFC), Wilson Liu (IPAC/Caltech), David Leisawitz (GSFC)

*VISIR mid-infrared imaging of the HD172555 debris disk*

**Eric Pantin** (DSM/IRFU/SAP CE Saclay and CNRS UMR 7158 Emmanuel Di Folco (Laboratoire d'Astrophysique de Bordeaux)

*DUNES: Pushing into the submillimetre*

**Göran L. Pilbratt** (European Space Agency, ESTEC/SRE-SA, Noordwijk), Jonathan P. Marshall and Carlos Eiroa (UAM, Madrid) and the DUNES team

*Spatially Resolving the Ice Line in Debris Disks with MMT/Clio and LBTI*

**Timothy J. Rodigas** (University of Arizona), Phil Hinz and Glenn Schneider (University of Arizona)

*Study of Scattered Light From Known Debris Disks*

**Joseph E. Rodriguez** (George Mason University), Alycia J. Weinberger (Carnegie Institution of Washington) and Aki Roberge (NASA Goddard Space Flight Center)

**Planets and Planet Formation**

*Discovery and Mass Measurements of a Cold, 10-Earth Mass Planet and Its Host Star*

**Richard K. Barry** (NASA GSFC) Y. Muraki (Konan University, Japan), (Chungbuk National University, Korea) D.P. Bennett, (University of Notre Dame), and B.S. Gaudi (Ohio State University)

*How to use a space-borne coronagraph to find exoplanets embedded in debris disks*

**Kerri Cahoy** (MIT) and Christopher Stark (Carnegie Institute of Washington, DTM)

*The Role of Stellar Mass in High-Contrast Imaging*

**Justin R. Crepp** (Caltech), John A. Johnson (Caltech)

*Estimates of the Planet Yield from Ground-based High-Contrast Imaging Observations*

**Justin R. Crepp** and John Asher Johnson (California Institute of Technology)

*Mid-infrared imaging of exo-Earths: impact of exozodiacal disk structures*

**Denis Defrère** (Max Planck Institute for Radioastronomy), O. Absil (University of Liege), C. Stark (Carnegie Institute of Washington), R. den Hartog and W. Danchi (Netherlands Institute for Space Research and GSFC)

*Numerical simulation of disk-planet interactions in protoplanetary disks.*

**Ruobing Dong**, Roman Rafikov and Jim Stone (Princeton University)

*Angular momenta of rarefied preplanetesimals and formation of small-body binaries*

**Sergei I. Ipatov** (Catholic Univ of America, Space Research Institute)

*The Potential to Form Planets in the Orion Nebula*

**Rita K. Mann** (NRC Herzberg Institute of Astrophysics) and Jonathan P. Williams (Institute for Astronomy)

*Signposts of planet-disk interactions*

**Hanno Rein** (Institute for Advanced Study)

*Constraining the theory of early planet formation with ALMA*

**Luca Ricci** (ESO, Caltech)

*Collisional Growth of Planetesimals*

**Andrew Shannon** and Yanqin Wu (University of Toronto)

*An Exoplanet Imaging Performance Study*

**Stephen C. Unwin** (JPL/Caltech)

*ALMA Seeking Planets*

**Al Wootten** (NAASC, NRAO)

Email a pdf or jpeg of your poster to [meredith.r.gibb@nasa.gov](mailto:meredith.r.gibb@nasa.gov) and she'll put it online!